

What is claimed is:

1. An optical device, comprising:
a substrate;
5 a first multi-layer film with a first refractive index,
that is formed on a first surface of the substrate;
a second multi-layer film with a second refractive index,
that is formed on a second surface of the substrate;
and
10 a stress correction film formed on the first or second
multi-layer film, correcting the distortion of the
substrate that is due to the difference in stress between
the first and second multi-layer films formed on the
first and second films, respectively.
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2. The optical device according to claim 1, wherein
said stress correction film is transparent for light
with a specific wavelength, and the optical film
thickness is an integral multiple of a half of the
20 specific wavelength.
3. The optical device according to claim 1, wherein
said stress correction film is made of SiO_2 .
- 25 4. The optical device according to claim 1, wherein

said stress correction film maintains the profile irregularity of the substrate one wavelength or less.

5. The optical device according to claim 1,
5 comprising:

a VIPA optical element further comprising:

said substrate being a plate that is transparent for light with a specific wavelength;

said first multi-layer film;

10 said second multi-layer film; and

said stress correction film maintaining the VIPA optical element flat, and

a mirror reflecting and returning the spectral components of light separated by the VIPA optical

15 element to the VIPA optical element, wherein

a dispersion compensator is realized by using said VIPA optical element and said mirror.

6. The optical device according to claim 1, wherein
20 said substrate comprising said first and second multi-layer films and said stress correction film is fixed on a fixing material having almost the same thermal expansion coefficient as the substrate.

25 7. The optical device according to claim 6, wherein

said fixing material is made of transparent glass or semiconductor.

8. The optical device according to claim 6, wherein
5 said fixing material is made of opaque metal or ceramic.

9. The optical device according to claim 6, wherein
said fixing material is made of copper-tungsten alloy,
Kovar alloy, alumina or BeO.

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10. The optical device according to claim 6, wherein
said substrate comprising said first and second films
and said stress correction film is fixed on said fixing
material by organic adhesives, metallic soldering or
15 low melting point glass.

11. The optical device according to claim 6, wherein
said substrate comprising said first and second films
and said stress correction film is fixed on said fixing
20 material at a plurality of points.

12. The optical device according to claim 6, wherein
said substrate comprising said first and second films
and said stress correction film is optically jointed
25 with said fixing material.

13. The optical device according to claim 12, wherein the material of the optically jointed surfaces is SiO₂.